Modelling of an Integrated SOA-Photonic Crystal Waveguide 2R Regenerator

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In [1] it is shown that a MiniStopBand(MSB) can be used to compress linearly chirped pulses. In this paper an Arbitrary Chirped Pulse(ACP)-FDTD method is developed where pulse data can be read in from a data file. This has allowed the FDTD code to be used in combination with a Semiconductor Optical Amplifier (SOA) model to study 2R regeneration for sub-picosecond pulses. As in [1] a modified W3 waveguide is used. The transmission through this structure has been modelled using both 2D FDTD and FEMLAB (inset in figure 1). The SOA has a 150fs input pulse centred at 1518nm. The output pulse is then fed into a PhC waveguide. Figure 1 shows the input and output pulses and pulse compression can be observed. The figure also shows the case where the pulse centre wavelength is moved further from the MSB to 1550nm and the pulse is dispersed.

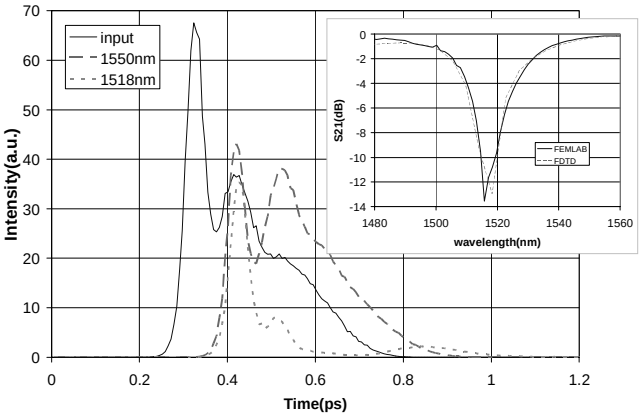

Fig. 1 : Input and output pulses from PhC waveguide, centre wavelength =1518nm and 1550nm. Inset MSB

[1] M.J.Cryan, T.Cao *et al*, PECS-V, Kyoto, Japan, March 2004.